Docket No.: 63190A
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Felipe Martinez.

Application No.: 10/560,732 Confirmation No.: 3731

Filed: December 15, 2005 Art Unit: 1782

For: THIN FOAMED POLYETHYLENE SHEETS Examiner: James C. Yager

APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

This brief is filed within six months of the February 14, 2011 filing of the Notice of Appeal. A petition for a one month extension of time accompanies this brief.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

Dow Global Technologies LLC., a reorganized company formerly known as Dow Global Tehnologies Inc.

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are twenty-three (23) claims in the application, seventeen (17) of which are still pending.

B. Current Status of Claims

1. Claims canceled: 7, 10, 19

2. Claims withdrawn from consideration but not canceled: 15, 16, 23

3. Claims pending: 1-6, 8, 9, 11-14, 17, 18 and 20-22

4. Claims allowed: none

5. Claims rejected: 1-6, 8, 9, 11-14, 17, 18 and 20-22

C. Claims on Appeal

The claims on appeal are claims 1-6, 8, 9, 11-14, 17, 18 and 20-22.

IV. STATUS OF AMENDMENTS

Appellants did not file any amendment after final, and thus no amendments are pending.

V. SUMMARY OF CLAIMED SUBJECT MATTER

In the following summary of the claimed subject matter, the reference numbers in parentheses indicates the location (page number, line number and/or claim number) from the specification as filed and published as WO2005/007729 where the element is described. These numbers are provided for the aid of the Board to quickly identify relevant section of the specification, but should not be considered to be the sole source of support.

The invention as set forth in independent claim 1 recites:

a) a blown film (1, 7)

b) consisting of one or more foamed sheets (4, 19-22)

c) at least one foamed sheet is 3 to 8 mils thick (4, 23 to 5,1)

d) that foamed sheet also has an MD tear strength of at least 150 g/mil (5, 13-29; original claim 1)

e) that foamed sheet is made from a blend (7, 15)

f) that blend comprises 10 -90 percent by weight LLDPE (4,12-13; original claim 7)

g) that blend also comprises 90 to 10 percent LDPE (4, 13-14; original claim 7)

h) the LLDPE has a density in the range of 0.900 to 0.930 g/cc (7, 14-18; original claim 10)

i) the LLDPE has a melt index (I2) in the range of from 2 to 6 g/ 10 min (7, 18-20; original claim 10)

j) the at least one foamed sheet has a density reduction of from 10 to 50 percent compared to a non-foamed sheet of the same composition 9 (5, 3-12).

The invention as set forth in independent claim 17 is similar to claim 1 except that the foamed sheet is less than 3 mils thick. Thus Independent claim 17 recites:

a) a blown film (1, 7)

b) consisting of one or more foamed sheets (4, 19-22)

c) at least one foamed sheet is less than 3 mils thick (5, 26)

d) that foamed sheet also has an MD tear strength of at least 50 g/mil (5, 28)

e) that foamed sheet is made from a blend (7, 15)

f) that blend comprises 10 -90 percent by weight LLDPE (4,12-13; original claim 7)

g) that blend also comprises 90 to 10 percent LDPE (4, 13-14; original claim 7)

h) the LLDPE has a density in the range of 0.900 to 0.930 g/cc (7, 14-18; original claim 10)

i) the LLDPE has a melt index (I2) in the range of from 2 to 6 g/ 10 min (7, 18-20; original claim 10)

j) the at least one foamed sheet has a density reduction of from 10 to 50 percent compared to a non-foamed sheet of the same composition 9 (5, 3-12).

Further embodiments recited in the dependent claims add limitations with respect to the sheet having a tear strength greater than 350 g/mil (5, 25); oxygen vapor transmission rate of at least 2.18 gr.mil/100 in^2*24 hrs (6, 1-10) water vapor transmission rate of at least 270 cc.mil/100 in^2*24 hr (6, 1-10); density reduction of at least 20 % (5, 9); increased amounts of the LLDPE component (9, 3-6); density and melt index ranges for LDPE component (8, 11-15), and specifies that the polyolefin sheets have no crosslinking (3, 22, original claim 14).

Claim 12, 13, 21, and 22 add details about the process by which the sheet was made. It is believed that these process limitations help to achieve the small foamed bubble size which is

believed to lead to the improved tear strength of these films. Thus claims 12 and 21 add that the film was made with a land length to die gap ratio of less than 25 (10, 30) and claims 13 and 22 adds that the blow up ratio is from 2.2 to 4 (11, 17-18).

VI. GROUNDS OF OBJECTION TO BE REVIEWED ON APPEAL

1. Whether claims 1-6, 8, 9, 11-14, 17, 18 and 20-22 are obvious over US 6,114,025 to DeVaudreuil et al. in view of US 4,360,556 to Heider.

2. Whether claims 12 and 21 are obvious over US 6,114,025 to DeVaudreuil et al. in view of US 4,360,556 to Heider, in further view of US 3,963,403 to Hughes et al.

VII. ARGUMENT

Claims 1-6, 8, 9, 11-14, 17, 18 and 20-22 are currently pending in the above-identified application. Claims 1-6, 8, 9, 11-14, 17, 18 and 20-22 are obvious over US 6,114,025 to DeVaudreuil et al. in view of US 4,360,556 to Heider. Additionally claims 12 and 21 over US 6,114,025 to DeVaudreuil et al. in view of US 4,360,556 to Heider, in further view of US 3,963,403 to Hughes et al.

DeVaudreuil et al. (US 6,114,025)

The primary reference used by the Examiner is DeVaudreuil. DeVaudreuil teaches the following (with the numbers in parentheses indicating the column and line numbers in DeVaudreuil which describe the element):

a) a blown film (12, 15-27)

b) consisting of one or more foamed sheets (1, 5-10)

c) at least one foamed sheet is less than 13mm, preferably from 0.5 to 13mm thick (7, 4-6)

d) that foamed sheet also has a preferred MD tear strength of greater than 2.00kN/m (2 kN/m is approximately equal to 6.11g/mil (8,11-12))

e) that foamed sheet is made from a blend (2, 60-65)

f) that blend comprises 1 -90 percent by weight LLDPE (2, 61)

g) that blend also comprises 99 to 10 percent LDPE (2, 65)

h) the LLDPE has a density in the range of 0.910 to 0.940 g/cc (3, 63)

i) the LLDPE has a melt index (I2) in the range of from 0.5 to 1.5 g/ 10 min (4, 4)

j) the at least one foamed sheet has a density of from 10 kg/m3 to 150kg/m3 (6, 53-54).

The following elements from claim 1 are missing from DeVaudreuil.

1) requirement that at least one foamed sheet is 3 to 8 mils thick;
2) MD tear strength of at least 150 g/mil;
3) The LLDPE has a melt index (I_2) in the range of from 2 to 6 g/ 10 min;
4) Density reduction of from 10 to 50 percent.

Taking these factors in order, the first recitation that is absent from DeVaudreuil is the requirement that the film has a thickness of from 3 to 8 mils thick. In response to this point the Examiner pointed to Col 7, lines 4-8 of DeVaudreuil for support that the range of thickness is "clearly overlapping". However the passage cited by the Examiner recites that the thickness is "less than 13mm" with a preferred range of from 0.5 mm to 13 mm (approximately 20 to 512 mils). The person of ordinary skill in the art does not read open ended statements like "less than 13 mm" in the mathematical sense, but rather considers the language in context. Given that the stated intended purpose of the films of Devaudreuil is to provide protective packaging for items such as furniture (see DeVaudreuil col. 1, lines 22-24) and that films less than 8 mils would offer almost no protection for such applications, and given that the examples were all 55 mils (1.4 mm) thick or greater, and given that the lowest limit actually stated in the document was 20 mils, and given that the reference has a statement at col. 7, line 8 that thicker cross-sections (than 13 mm) were contemplated without mentioning lower ranges, it is respectfully submitted that this reference would not be considered by a person of ordinary skill in the art to fairly teach foamed sheets having a thickness less than 8 mils as required by the present claims, despite being mathematically included in the statement "less than 13 mm". Indeed, considering that 13 mm is approximately 64 times the upper limit of the present claims, saying that "less than 13mm" fairly teaches films having a range of 3 to 8 mils is akin to saying that an advertising boast that a particular automobile gets "over 30 mpg" fairly teaches a vehicle getting 1920 mpg. Clearly no one remotely skilled in the art of automobiles would think that, "over 30 mpg" includes all values greater than 30, because of the context in which such statements are made.

Next is the requirement in Claim 1 that the films have an MD tear strength of at least 150 g/mil. DeVaudreuil states (at col.8, line 12) a most preferred MD tear strength of "greater than about 2.00 kN/m, which is the equivalent of about 6.11g/mil. Moreover in the Examples presented in Table 1, the Example with the highest MD tear strength (Example 14) only had an MD tear strength of 4.26 kN/m, or about 13.01 g/mil, which is more than a factor of ten less than required in the present invention. In this regard, it is respectfully pointed out that the Examiner's assertion that since the foams of DeVaudreuil are made of the same materials as recited in the present application (which is not actually correct, given the difference in melt index, as described below), the foams of DeVaudreuil would inherently have the same properties such as tear strength, is negated by the values actually reported in the Examples.

Next, Claim 1 requires that the LLDPE component has a melt index (MI) in the range of from 2 to 6 g/10 min, whereas DeVaudreuil recites that its LLDPE component has an MI of from 0.5 to 1.5 g/10 min. Melt index relates to the flowability of the polymer at the given temperature (190°C) under a given force (2.16 kg). As such, this parameter would be expected to be correlated with foaming properties which in turn will be related to the resulting tear strength. As explained at page 6, lines 24-26 in the specification, it is believed that the improved tear properties are related to the sheets having a very fine cell structure with homogeneously dispersed bubbles. Using material with lower MI (i.e material which does not flow as readily) may affect DeVaudreuil's sheets ability to acheive these characteristics and therefore explain why those sheets had so much poorer tear strength.

Finally, Claim 1 requires a density reduction in the range of from 10 to 50%. Although DeVaudreuil does not report density reduction, it teaches that its foams will have a final density in the range of from 10 kg/m^3 to a maximum of about 150 kg/m^3 (see col 6, lines 53-54). Given that the starting materials specified in DeVaudreuil have a density of about 920 kg/m^3, this represents a density reduction of about 83-99%, which is far in excess of what is claimed in the present application. As the density reduction is caused by increased volume of bubbles, and as bubbles offer no tear resistance, it is not surprising that the sheets of DeVaudreuil have such poor tear resistance as compared to the sheets of the present invention.

Claim 17 and those which depends from it, further restrict the film thickness to less than 3 mils, but also reduce the MD tear strength to 50 g/mil. The above arguments thus apply equally to those claims.

Accordingly, it is clear that DeVaudreuil does not teach suggest the recitations of the present claims. The Examiner acknowledges this, but contends that a person of ordinary skill in the art would modify Devaudreuil with the teachings of Heider (US 4,360,556).

Heider (US 4,360,556)

Heider teaches the following (with the numbers in parentheses indicating the column and line numbers in DeVaudreuil which describe the element):

a) a film (1, 10)

b) consisting of one or more foamed sheets (1, 10)

c) at least one foamed sheet from 14 to 18 mils (3, 21)

d) no indication of tear strength

e) that foamed sheet is made from polyethylene or copolymers thereof or polypropylene or copolymers thereof (4, 19-21)

f) the at least one foamed sheet has a density reduction of from 10 to 20 percent (1, 68).

The following elements from claim 1 are missing from Heider:

1) no disclosure that the films are blown films
2) no disclosure of sheets having a thickness of 8 mils or less
3) no disclosure of tear strength or that the invention of Heider will improve tear strength
4) no indication that the film should be a blend, particularly a blend of LLDPE and LDPE.
5) no indication of density and/or melt index of LLDPE

The Examiner has acknowledged that DeVaudreuil specifies too great of a density reduction, but claims that claim 1 is obvious over DeVaudreuil when combined with US

4,360,556 to Heider. Heider teaches a foamed low density sheet having a density reduction of about 10 to 20 percent. Thus the Examiner contends that a person of ordinary skill in the art would combine the teachings of DeVaudreuil with the teaching in Heider to reduce the density by only 10 to 20 percent, and that the resulting film would inherently have the improved tear strength recited in the present claims. It is first noted that even, for the sake of argument, assuming all of the above is true, combining Heider with DeVaudreuil still does not address films having a thickness of 8 mils or less, nor does such combination teach using LLDPE having a melt index of from 2 to 6. Thus, the Examiner has not made a *prima facie* showing of obviousness.

Just as importantly however, it is respectfully submitted that a person of ordinary skill in the art would not make combination of DeVaudreuil with Heider as suggested by the Examiner. Heider relates to sheet material which "may be fabricated into carriers for attachment to cylindrical carriers" (i.e. "six pack rings")(column 1, lines 11-12). The stated goal of Heider is provide "a reduction in weight to the sheet material without a corresponding reduction in specific properties of the fabricated carrier" (column 1, lines 15-17). As explained in the applicant's specification, the goal of the present invention is not to reduce weight, but rather to improve the perception of thin films which were identified as having a limp or flimsy feel (see page 1, lines 18-20 of the present application). It is therefore not clear why a person of ordinary skill in the art would seek to apply the weight reduction techniques of Heider to a film application in which weight reduction a) is not the goal and b) would not even occur (as the total weight would remain the same, in the present invention).

Further, without even considering the stated goals of the present invention, it is also respectfully submitted that a person of ordinary skill in the art would also not seek to modify DeVaudreuil. DeVauderuil teaches that its foamed film is intended to be used for "protective packaging of heavy, delicate, and valuable items such as furniture" (see DeVaudreuil col. 1, lines 22-23). Protecive films designed to prevent dents in wood have very different physical requirements compared to foamed film intended for six-pack carrier rings. For the protective foams of DeVaudreuil, the weight is not as important as the resiliency of the foam, whereas resiliencey is not a critical factor at all for six-pack carriers. The function of the bubbles in protective films is to provide that resiliency. Thus it is not clear why a person of ordinary skill in the art would seek to modify the resilient foams of DeVaudreuil by decreasing the density reduction from 83 to 99% to only 10 to 20 % as taught by Heider, knowing that such change

would make them less resilient, and therefore less effective for their intended function. Moreover, the fact that Heider was published about 16 years before DeVaudreuil was filed, and yet DeVaudreuil still teaches density reduction of at least 83% is a strong indication that a person of ordiary skill in the art would *not* modify the foams of DeVaudreuil as suggested by the Examiner.

The Examiner has characterized the recitation of films of 3 to 8 mil thickness as a matter "within the bounds of routine experimentation". Applicant respectfully contests this assertion. While thinner films are generally acknowledged to be preferred, it is readily understood that there are consequences to such downguaging in terms of degradationof physical properties of the films as well as limitations on the equipment. Indeed, if making thinner films was simply a matter of routine optimazion then all films would be fraction of a mil in thickness, as absent degradation of properties it would always be preferred to make thinner films as they would be more economical as they would require less resin to make and be easier to ship. As would be readily understood by one of ordinary skill in the art, as the film becomes thinner and thinner, the strength (among other properties) of the film will also decrease. At some point the foam bubbles eventually will be larger than the thickness of the film at which point the integrity of the film will fail, making it clear that there is a limit to thinness achievalble through routine optimization. Thus blown films having claim 1's combination of thinness while simultaneously achieving good MD tear strength, is not simply a matter of optimization as these properties tend to run counter to each other.

For these reasons, the rejections under 35 USC §103(a) based on DeVaudreuil in combination with Heider are improper.

Hughes et al. (US 3,963,403)

Claims 12 and 21 were also rejected under 35 USC §103(a) as being unpatentable over DeVaudreuil/Heider in light of Hughes et al (US 3,963,403). Hughes does not refer to films at all, nor blends of LLDPE and LDPE as recited in the present claims. Since claims 12 and 21 depend from claim 1 or 17 and since Hughes does not address any of the shortcomings of DeVaudreuil or Heider discussed above, it is respectfully requested that this rejection should also be reversed. Moreover, Hughes is cited for the proposition that land length to die gap ratios of less than 25 are known. While this may be true, it is respectfully submitted that techniques for use in extrusion techniques for making pipe would not be considered relevant to a person of ordinary skill in the art making blown film. There is no teaching that such techniques would

result in fine homogeneous bubbles in a blown film applicatio, or that such structure woud improve tear strengh. This is a second reason why this rejection of these particular claims should be reversed.

Conclusion

The references cited by the Examiner would not be combined in the manner suggested by the Examiner, and at any rate, do not disclose the complete combination of elements recited in the present claims.

Therefore a reversal of all grounds for rejection is earnestly solicited of this Board.

VIII. CLAIMS

A copy of the claims involved in the present appeal is attached hereto as Appendix A.

IX. EVIDENCE

None

X. RELATED PROCEEDINGS

None

Dated: May 16, 2011

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